United States
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Animal and
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Inspection
Service

**National Wildlife
Research Center**

Managing Reproduction in Canada Geese

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Scientists Explore Mechanisms to Reduce Canada Goose Fertility

Wildlife Services' (WS) National Wildlife Research Center (NWRC) is the only Federal research facility devoted exclusively to resolving conflicts between people and wildlife through the development of effective, selective, and acceptable methods, tools, and techniques.

WS has given high priority to research on the reproductive management of various bird and mammal species frequently involved in conflicts with people. In the past 10 to 15 years, the number of conflicts between wildlife and humans has increased significantly, posing safety hazards to airline travelers, and causing health concerns in urban areas. In addition, wildlife damage to crops and environmental damage to rangelands have resulted in the loss of millions of dollars in agricultural production. The goal of this research project is to develop and field test economical and effective agents to control fertility in overabundant bird populations.

Groups Affected by These Problems:

- Airports
- Airlines
- Airline passengers
- Urban citizens using recreational facilities
- Golfers
- Farmers
- Livestock producers
- Natural resource managers

Research Accomplishments:

- WS demonstrated that the chemical, nicarbazin, has potential as a reproductive inhibitor for Canada geese.

Of particular concern is the increasing population of Canada geese in urban areas. NWRC scientists are currently studying the chemical nicarbazin as a possible means for reducing reproduction in Canada geese. Nicarbazin is already approved by the Food and Drug Administration for use in broiler chickens to manage the disease coccidosis. When fed to chickens in high concentrations, one of the side effects of nicarbazin is lowered egg production. In addition, fertilized eggs do not hatch. The chickens themselves, however, do not experience any adverse side effects from the drug.

Applying Science and Expertise to Wildlife Challenges

Nicarbazin—NWRC researchers are working to determine whether nicarbazin is as effective at inhibiting reproduction in Canada geese as it is in chickens. To determine the proper dosage for Canada geese, NWRC researchers are comparing blood and egg absorption rates of various concentrations of nicarbazin. Additionally, NWRC scientists are formulating a corn-based bait, containing nicarbazin that can be fed to Canada geese. This bait and several delivery

systems are being tested in penned settings at NWRC. Efficacy and safety trials are taking place at several locations throughout the United States with large Canada goose populations during the breeding season. In the spring of 2001, nicarbazin was coated onto cracked corn and fed to 2 Fort Collins, CO goose populations. Baiting occurred daily at loafing sites and within some nesting territories. Nest boxes were checked periodically for eggs and hatching. Any eggs that did not hatch were collected for analysis. Nicarbizin reduced hatchability at one site by 70 percent. In addition to monitoring nesting success, geese were fitted with neck collars to monitor their movements outside of the nesting season.

A private company that owns nicarbazin provided initial funding in Fiscal Year (FY) 2000 for NWRC to perform analytical methodology on the drug. The company also submitted and received approval for an Investigational New Animal Drug (INAD) permit that allows efficacy and safety studies to be conducted on nicarbazin for its use as a reproductive inhibitor for Canada geese. In addition, a Congressional directive allocated funds to NWRC in FY 2000 and FY 2001 to conduct research and evaluation of nicarbazin as a means of controlling avian populations for airport safety.

Selected Publications:

- Stahl, R.S., and J.J. Johnston. 2002. High performance liquid chromatography-based determination of nicarbazin in waterfowl. *Journal of Chromatography* 775:103-108.
- Johnston, J.J., M.J. Goodall, and J.C. Hurley. 2001. Determination of diazacon in quail and quail serum by ion pair reversed-phase chromatography. *Journal of AOAC International* 84:634-639.
- VerCauteren, K.C., M.J. Pipas, and K.L. Tope. 2001. Evaluations of nicarbazin-treated pellets for reducing the laying and viability of Canada goose eggs. Pages 337- 346. Proceedings of the Ninth Wildlife Damage Management Conference.
- Primus, T.M., D.J. Kohler, M. Goodall, C. Yoder, D. Griffin, L Miller, and J.J. Johnston. 2001. Determination of 4,4'- dinitrocarbanilide (DNC), the active component of the antifertility agent nicarbazin in chicken, duck, and goose plasma. *Journal of Agricultural and Food Chemistry* 49(8):3589 3593.